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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/740,252	12/19/2000	Mooi Choo Chuah	M-C Chuah 51-5-17-4-6-25	4889

7590 10/07/2004

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EXAMINER	
MAIS, MARK A	

ART UNIT	PAPER NUMBER
2664	

DATE MAILED: 10/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/740,252	CHUAH ET AL.	
	Examiner	Art Unit	
	Mark A Mais	2664	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-19 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-19 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 19 December 2000 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) was submitted together with the Application on December 19, 2000. The submission is in compliance with the provisions of 37 CFR 1.56 and 1.97. Accordingly, the examiner considered the information disclosure statement.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-2 and 13-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Stover (USP 4,142,069).

4. With regard to claim 1, Stover discloses a method for determining information at a first network node for adjusting a clock at a selected second network node, the method comprising:

determining an estimate of the offset of said clock at said second node relative to the clock at said first node **(equation 2, col. 4, line 35)**, and

determining an estimate of bias of said estimate of said clock offset **(the estimate of the error in the local clock, col. 12, line 64 to col. 13, line 29)**.

5. With regard to claim 13, Stover discloses a method for adjusting a clock at a selected second node to be more nearly in synchronism with a clock at a first node, the method comprising

determining an estimate of the offset of said clock at said second node relative to the clock at said first node **(equation 2, col. 4, line 35)**, and determining an estimate of bias of said estimate of said clock offset **(the estimate of the error in the local clock, col. 12, line 64 to col. 13, line 29)**; and

sending said estimate of said offset and said estimate of said bias to said second node to effect said adjustment of said clock at said second node. **(offset Ta –Tb, and error E, col. 16, line 60 to col. 17, line 45)**.

6. With regard to claims 2 and 14, Stover discloses exchanging a plurality of rounds of ordered time-stamped messages between said first node and said second node **(equation 1, col. 4, line 29 and equation 2, col. 4, line 40; inherently, multiple rounds of exchanging messages is the reason a probability distribution function is used to estimate the error in the local clock, col. 14, lines 15-18)**.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Stover in view of Douceur

8. Claims 3-6 and 15-19 are rejected under 35 U.S.C. 103(a) as obvious over Stover, as applied to claims 1-2 and 13-14 above, further in view of Douceur (USP 4,142,069).

9. With regard to claims 3-4, Stover does not specifically disclose sending one message containing the specific timestamp information for the messaging between the first and second node. Stover only discloses that the signal transit time, Dab, between the first and second nodes, must take into account the transmit and the receive times of the synchronization code in each direction **(the time of transmission is controlled (known), the time of reception is measured, and then this measurement is sent back to the original transmitter, col. 4, lines 5-23)**. Stover is silent as to whether the time difference measurements are sent with the actual timestamps. However, it is well known that time-differences can be determined at the receiver, and sent back to the transmitter; or by send the timestamp information back to the transmitter; or both. Moreover, Douceur (USP 5,907,685) discloses sending three timestamps in the second message, M2, that include the transit time of the first message, the receive time of the first message, and the transmit time of the second message, which it uses with the receive time of the second message to determine the estimated local offset **(fig. 4, col. 7, lines 29-32)**. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to have sent the timestamp information in the second message in order for the master node to perform the

calculations for calculating the estimated local offset in order to achieve synchronization between all the clocks **(col. 5, lines 26-28)**.

10. With regard to claim 5, Stover discloses determining X= T1 – T0 **(equation 1, col. 4, line 29)** and Y = T3 – T2 **(equation 2, col. 4, line 35)**,

where T3 – T2 = Dd – Q + Ed and T1 – T0 = Du + Q + Eu, and where Q is the offset of the clock at said second node from the clock at said first node **(equation 3, col. 4, line 40)**, Du **(Dab, col. 4, lines 21-22)** is the fixed delay experienced by a message from said first station to said second station, Dd **(Dba, col. 4, lines 22-23)** is the fixed delay experienced by a message from said second station to said first station, with Du and Dd being equal or individually known **(col. 10, lines 11-14)**, Eu is the variable delay at said ith round for a message from said first station to said second station **(equation 6, calculated as E, col. 13, lines 21-24)**, Ed is the variable delay at said ith round for a message from said second station to said first station **(calculated as E, col. 13, lines 21-24)**.

11. With regard to claim 6, Stover discloses determining an estimate, Qn, of Q based on Xi and Yi after n message exchanges between said first node and said second node, wherein the calculated offset, Tb – Ta, in equation 3 **(col. 4, line 40)**, is estimated using the statistical estimates for Dba and Dab, that is, the error and variance calculations **(equations 6 and 7, col. 13, lines 15-29)**.

12. With regard to claim 15, Stover discloses said first node is a time-server node providing estimates of offset of said clock and estimates of bias of said estimates of offset of said clock for each of a plurality of second nodes **(interpreted as master nodes serving neighboring nodes, col. 5, lines 17-25)**.

13. With regard to claim 16, Stover discloses that at least some of said second nodes are time-server nodes serving respective pluralities of said second nodes **(alternate master nodes serving neighboring nodes, col. 5, lines 17-25)**.

14. With regard to claims 17-19, Stover discloses said exchanging of a plurality of rounds of messages is initiated (a) for each of a plurality of second nodes by said first node; and, in at least some second nodes, (b) by respective ones of said second nodes **(Stover discloses that the exchanges occur between all proximate nodes wherein the nodes are provided a unique rank structure (determining master, alternate master, and neighbors, col. 5, lines 17-25) and the plurality of messaging occurs between proximate nodes in according to the rules for time reference distribution (col. 9, lines 6-8)). (*see also* discussion of timestamp information distributed via messaging for claims 3-4 in paragraph 8 above)**

Stover in view of Douceur further in view of Skelly et al.

15. Claims 8-12 are rejected under 35 U.S.C. 103(a) as obvious over Stover in view of Douceur as applied to claims 3-6, and 15-19 above, further in view of Skelly et al. (USP 6,661,810).

16. With regard to claim 7, Stover discloses does not specifically disclose that Qn = (Un – Vn)/2 wherein Un = min{Xi} and Vn = min{Yi}. Stover discloses the timing offset, Tb – Ta, in equation 3, **(col. 4, line 40)**, can be calculated from the round-trip time differences measured at each node divided by 2, wherein the time differences Dab and Dba cancel each other out **(because they are equal, col. 4, lines 42-45)**. While Stover uses a probability distribution function for the estimation, it is silent as to the minimum value function for performing this particular network delay measurement estimation. Douceur also uses a probability distribution function for estimation **(col. 11, lines 8-10)**. Douceur, too, is silent as to the minimum value function. However, the minimum value function is disclosed in Skelly et al. Specifically, the minimum value function in Skelly et al. helps with the probability distribution function estimation of network delay measurements **(minimizing the vertical distance between the statistical estimates for delay and the actual delay measurements (i.e., end-to-end delay), col. 10, line 64 to col. 11, line 17)**. Thus, using the minimum value function allows the probability distribution function for error E **(equation 6, col. 13, lines 21-24)** in Stover to be estimated as a normal distribution.

17. With regard to claims 8-12, Stover discloses that an estimate of bias **(E, equation 6, col. 3, lines 21-24)** of said estimate of clock offset, is determined based on separate determinations of X = T1 – T0 **(equation 1, col. 4, line 29)** and Y = T3 – T2 **(equation 2, col. 4, line 35)**. Stover further discloses the timing offset, Tb – Ta, in equation 3, **(col. 4, line 40)**, can be calculated from the round-trip time differences measured at each node divided by 2, wherein the time differences Dab and Dba cancel each other out **(because they are equal, col. 4, lines 42-45)**.

However, Stover also discloses keeping in the time differences Dab and Dba to help with calculating the estimated offset Qn **(discussed in paragraph 11 above)**. While Stover uses a probability distribution function for the estimation, it is silent as to the minimum value function for performing this particular network delay measurement estimation. Douceur also uses a probability distribution function for estimation **(col. 11, lines 8-10)**. Douceur, too, is silent as to the minimum value function. However, the minimum value function is disclosed in Skelly et al. Specifically, the minimum value function in Skelly et al. helps with the probability distribution function estimation of network delay measurements **(minimizing the vertical distance between the statistical estimates for delay and the actual delay measurements (i.e., end-to-end delay), col. 10, line 64 to col. 11, line 17)**. Thus, using the minimum value function allows the probability distribution function for error E **(equation 6, col. 13, lines 21-24)** in Stover to be estimated as a normal distribution, and, therefore, the calculation of the estimated bias of the estimated clock offset,

$bn = EF[Qn] - Q$

$= ((EF[\min\{Xi\}] - EF[\min\{Yi\}])/2) - Q$

$= \frac{1}{2}(Yx - Yy) - \frac{1}{2}(\min\{X1\} - \min\{Yi\})$, where $Yx = EF[\min\{Xi\}]$ and $Yy = EF[\min\{Yi\}]$.

Moreover, using math substitutions,

the bias-corrected estimate for $Q = (\min\{X1\} - \min\{Yi\}) - \frac{1}{2}(Yx - Yy)$.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

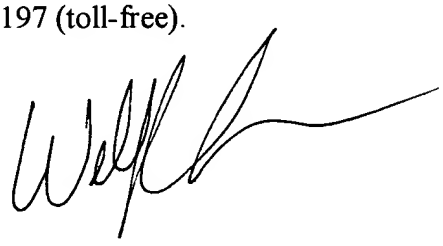
(a) Ogus (USP 6,857,875), Network Protocol and Associated methods for optimizing use of available bandwidth.

(b) Fischer et al. (US Patent Publication 2002/0163932), Method of providing synchronous transport of packets between asynchronous network nodes in a frame-based communications network.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark A Mais whose telephone number is (703) 305-6959. The examiner can normally be reached on 8:00-4:30.

19. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on (703) 305-4366. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

20. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



September 29, 2004